## REMARKS/ARGUMENTS

Claims 1-22 are pending. Applicants appreciate the withdrawal of the indication of finality in the office action mailed December 9, 2003 (Paper no. 7). Applicants note that the references provided by the Examiner are difficult to read, because the highlighting used by the Examiner has resulted in a copy of the references in which the cited sections and figures are practically illegible. In the future, underlining or markings in the margin are respectfully requested, so that the cited sections can be read without having to obtain new copies of the cited references.

### 35 USC §103 Rejections

Claims 1-8, 10-15, and 19-22 stand rejected under 35 U.S.C. § 103(a) as being anticipated by U.S. Patent Number 6,397,044 B1, granted to Nash et al. (hereinafter "*Nash*") in view of U.S. Patent No. 6,226,276, granted to Na (hereinafter "*Na*"). Claims 9 and 16-18 stand rejected under 35 USC 103(a) as being unpatentable over *Nash* in view of *Na* and further in view of U.S. Patent Number 5,152,005 granted to Bickley (hereinafter "*Bickley*"). These rejections are respectfully traversed.

*Nash* in view of *Na* fails to provide a prima facie basis for rejection of claims 1-8, 10-15, and 19-22 under 35 U.S.C. § 103(a), because they fail to disclose each element of the claimed invention. For example, claim 1 includes "a direct-conversion receiver receiving a signal modulated on a carrier frequency signal, the direct-conversion receiver further comprising one or more subharmonic local oscillator mixers; a local oscillator coupled to the direct conversion receiver, the local oscillator generating a signal having a frequency equal to a subharmonic of the carrier frequency signal; and a transmitter coupled to the local oscillator, wherein the local oscillator is the transmitter oscillator." It is admitted that *Nash* fails to disclose the transmitter coupled to the local oscillator, wherein the local oscillator is the transmitter oscillator, but it is alleged that *Na* discloses a local oscillator 220 that is the transmitter 231. However, this assertion is incorrect – *Na* discloses that a signal from two local oscillators, 220 and 227, is used to transmit the signal. "As to a second local oscillator in the transmitter, a voltage controlled oscillator 227 generates a second local oscillation frequency f(LO2) which is N times the

transmission intermediate frequency f(TxIF)." *Na*, col. 7, line 65 to col. 8, line 1. In "the transmission mode, the frequency divider 229 divides by two the second local oscillation frequency f(LO2) output from the voltage controlled oscillator 227, to generate the transmission intermediate frequency f(TxIF) to a bandpass filter 230." *Na*, col. 8, lines 44-49. "In the transmission mode, the mixer 231 mixes the transmission intermediate frequency f(TxIF) from the bandpass filter 230 with the first local oscillation frequency f(LO1) from the buffer 223, to generate a transmission carrier frequency f(Tx) to a bandpass filter 232." *Na*, col. 8, lines 57-61. Thus, it is clear that both voltage controlled oscillator 220 **and** voltage controlled oscillator 227 are needed to generate the transmission signal – i.e., neither one operating alone is the transmission oscillator.

Furthermore, *Na* discloses that the first local oscillator 220 generates a frequency which is one-half of 890-893.9 MHz, but the transmission and reception frequency of the system of *Na* is 910.05 – 913.95 MHz. As such, first local oscillator 220 is not a "local oscillator generating a signal having a frequency equal to a subharmonic of the carrier frequency signal."

Furthermore, as noted, *Nash* teaches away from any combination with other art, such as *Na*, to yield the invention of claim 1. As stated in *Nash* at col. 2, lines 30-37, in "conventional direct conversion transceivers the requirement for the transmitter to run from the same local oscillator as the receiver is met because the local oscillator is on-channel, i.e., it runs at the carrier frequency. However, in a direct conversion receiver using a local oscillator at a subharmonic of the reference frequency, ***it is no longer possible to directly use the local oscillator in the transmitter design***." (Emphasis added). As shown above, *Na* confirms this disclosure of *Nash*, and requires two local oscillators, both of which operate at a frequency other than a subharmonic of the reference frequency.

The same arguments apply for the method of claim 11, which includes "receiving a carrier signal modulated with a data signal; mixing the carrier signal with a subharmonic local oscillator signal to extract a baseband signal; modulating an outgoing data signal with the subharmonic local oscillator signal." *Na* discloses that a signal from the first local oscillator 220 and the second local oscillator 227 are both required to generate the transmission frequency, and that neither of these oscillators are subharmonic to the carrier signal.

Likewise, claim 20 includes "a low noise amplifier receiving a modulated incoming carrier

signal having a carrier signal frequency; a local oscillator generating a signal having a subharmonic frequency of the carrier signal; a first mixer coupled to the low noise amplifier and the local oscillator, the first mixer receiving the modulated incoming carrier signal and generating an in-phase incoming data signal; a second mixer coupled to the low noise amplifier and the local oscillator, the second mixer receiving the modulated incoming carrier signal and generating a quadrature phase incoming data signal; a modulator coupled to the local oscillator, the modulator receiving an outgoing data signal and modulating the outgoing data signal onto the local oscillator signal to generate an outgoing modulated carrier signal; and a transmit amplifier coupled to the modulator, the transmit amplifier amplifying the outgoing modulated carrier signal to a transmission power level." The rejection of claim 20 under 35 U.S.C. 103 is improper, because *Nash* in view of *Na* would not infringe claim 20 as properly construed due to the fact that *Nash* includes a receiver oscillator 22 and a transmitter oscillator 31, and *Na* requires two oscillators to generate the transmission frequency, neither of which generates a signal having a subharmonic frequency of the carrier signal. In order for *Nash* in view of *Na* to infringe claim 20, the local oscillator of claim 20 would have to be construed to cover both the receiver oscillator 22 and the transmitter oscillator 31 of *Nash*, or the first local oscillator 220 and the second local oscillator of *Na*, either of which is improper. Furthermore, excluding the transmitter oscillator 31 of *Nash* from the system of *Nash* would render the system non-functional, just as excluding the second local oscillator 227 of *Na* would render the system of *Na* non-functional, such that *Nash* in view of *Na* fails to provide a prima facie basis for the rejection of claims 1, 11, or 20 under 35 U.S.C. 103. *Nash* and *Na* also explicitly teaches away from excluding the transmitter oscillator 31 or the second local oscillator 227, as previously discussed, and neither local oscillator of *Na* generates a signal that is a subharmonic of the carrier frequency.

Claims 2-8 and 10 depend from claim 1, claims 12-15 and 19 depend from claim 11, and claims 21 and 22 depend from claim 20, and each are allowable for at least the reasons that they depend from an allowable base claim and add limitations not found in the prior art. Withdrawal of the rejection and allowance of these claims is requested.

The rejection of claims 9 and 16-18 as being unpatentable under 35 U.S.C. 103(a) over *Nash* in view of *Na* and further in view of *Bickley* is likewise improper for the reasons discussed above in regards to claims 1 and 11. Furthermore, in regards to the combination of *Nash*, *Na* and

*Bickley*, there would be no motivation for the combination because *Nash* does not require "a switch coupled between the local oscillator and the phase locked loop, wherein the switch can couple the phase locked loop to the local oscillator during a transmit cycle and can decouple the phase locked loop from the local oscillator during a receive cycle," as it uses a separate receiver oscillator 22 and transmitter oscillator 31, which transmit and receive at different frequencies. See, e.g. *Nash* at col. 2, lines 27-29 ("In GSM the duplex spacing is 45 MHz in 900 MHz band and 75 MHz in 1.8 GHz band.") Likewise, *Bickley* teaches away from the combination, as *Bickley* discloses at column 4, lines 25-29, that "synthesizer 20 operates in either a ***modulated*** transmit mode or an ***unmodulated*** receive mode," where PLL 250 is used in the modulated transmit mode but not in the unmodulated receive mode. Thus, there would be no motivation for combining *Nash*, which uses modulated transmit and receive modes, with *Bickley*, which uses a modulated transmit mode and an unmodulated receive mode.

Claim 16 includes "frequency modulating the subharmonic local oscillator signal during a transmit cycle; and interrupting frequency modulation of the subharmonic local oscillator signal during a receive cycle," and claim 17 includes "opening a phase locked loop during the transmit cycle to lock the subharmonic local oscillator signal." Again, a single subharmonic oscillator is used to modulate the receive and transmit cycle, and the phase locked loop is being switched to frequency modulate the local oscillator during the transmit cycle. In addition to the fact that *Nash*, *Na* and *Bickley* each teach away from the combination, the combination fails to disclose each element of the invention of claims 16 through 18 (as well as the elements of the claims that they depend from), and therefore fails to provide a prima facie basis for the rejection of the claims.

Withdrawal of the rejection of claims 9 and 16-18 under 35 U.S.C. 103(a) over *Nash* in view of *Na* and *Bickley* and allowance of these claims is respectfully requested.

## CONCLUSION

In view of the foregoing remarks and for various other reasons readily apparent, Applicant submits that all of the claims now present are allowable, and withdrawal of the rejections and a Notice of Allowance are courteously solicited.

If any impediment to the allowance of the claims remains after consideration of this amendment, a telephone interview with the undersigned at (214) 969-4669 is hereby requested so that such impediments may be resolved as expeditiously as possible.

No additional fee is believed to be due. If any applicable fee or refund has been overlooked, the Commissioner is hereby authorized to charge any fee or credit any refund to the deposit account of Akin, Gump, Strauss, Hauer & Feld, L.L.P., No. 01-0657.

Respectfully Submitted,

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